The "White" Strip in "15Kh1M1F" Grade Steel Joints SOV/125-58-12-2/13

ASSOCIATIONS: Institut elektrosvarki imeni Ye.O. Patona (Institute of Electric Welding imeni Ye.O. Paton). Khar'kovskiy turbinnyy zavod imeni Kirova (The Khar'kov Turbine Plant imeni Kirov)

SUBMITTED: August 21, 1958

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SOV/32-24-7-28/65

AUTHOR: Kasatkin, B. S.

TITLE: The Microstructure Exposure of Low-Carbon Steel by the Method of Electrolytic Polishing and Etching (Vyyavleniye mikrostruktury malouglerodistoy stali metodom elektroliticheskoy polirovki i travleniya)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 7, pp. 842 - 843 (USSR)

ABSTRACT: This investigations were carried out with the assistance of G.I.Parfess and V.A.Sidlyarenko. The microsections were mechanically polished in a careful manner. Then they were polished electrolytically in an electrolyte consisting of a mixture of chloric-(5%) and glacial acetic acid at 100 V and with a current density of 0,015 Amps/cm^2 for 3-6 seconds. Stainless steel served as cathode. The subsequent electrolytic etching was performed with a methanol solution of 0,5% iron chloride and 1,0% hydrochloric acid at from 16 to 20 V and 0,15 -0,20 Amps/cm^2 during 3-6 seconds, also with a stainless steel cathode. Prints of micrographs of the microstructure

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of technical iron after an annealing at 1000°, of microfissures occurring in the transition to the plastic deformation, the boundaries of the sub-grains being visible, and of twins in technical iron are given. Mention is made of the fact that the shape of the twins depends on the outcrop of dislocations and the properties of plastic deformation in twinning. Pertinent remarks in the paper by V.I.Startsev and V.M.Kasevich (Ref 4) are mentioned. There are 3 figures and 4 references, 2 of which are Soviet.

ASSOCIATION: Institut elektrosvarki im.Ye.O.Patona Akademii nauk USSR (Institute of Electric Welding imeni Ye.O.Paton, AS UkrSSR)

Card 2/2

PHASE I BOOK EXPLOITATION SOV/4091

Kasatkin, Boris Sergeyevich, and Simon L'vovich Mandel'berg

Elektrodugovaya svarka nizkolegirovannykh staley (Electric-Arc Welding of Low-Alloy Steels) Moscow, Mashgiz, 1959. 68 p. (Series: Biblioteka svarshchika) 9,000 copies printed.

Editorial Board: A.Ye. Asnis, A.A. Kazimirov, B.I. Medovar, B.Ye. Paton (Resp. Ed.), and V.V. Podgayetskiy; Ed. of this Publication: A.Ye. Asnis, Candidate of Technical Sciences; Chief Ed. (Southern Division, Mashgiz): V.K. Serdyuk, Engineer; Ed. of Publishing House: V.V. Mayevskiy, Engineer.

PURPOSE: This booklet is intended for welders.

COVERAGE: The booklet deals with the characteristic features of manual (unshielded), automatic flux, and gas-shielded arc welding of low-alloy structural steels. Specifications for the types of steel most commonly used are given. The mechanical properties of welded joints made by different welding methods are described.

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Electric-Arc (Cont.)

AVAILABLE: Library of Congress (TA 478 .K37)

VK/pw/jb
8-10-60

Card 3/3

KASATKIN, B.S.

25(1) PHASE I BOOK EXPLOITATION SOV/3421

Akademiya nauk USSR, Kiyev, Institut elektrosvarki imeni akademika Ye.O. Patona

Vnedreniye novykh sposobov svarki v promyshlennost', vyp. 2 (Introduction of New Welding Methods in Industry; Collection of Articles, No. 2) Kiyev, Gos. izd-vo tekhn. lit-ry Ukrainskoy SSR, 1959. 194 p. Errata slip inserted. 3,000 copies printed.

Ed.: V. Garkusha; Tech. Ed.: S. Matusevich.

PURPOSE: This book is intended for workers in the welding industry.

COVERAGE: The book contains a discussion of welding techniques and problems by groups of scientists and welders. Much attention is given to problems in the application of new methods of mechanized welding and electro-slag welding. This is the second collection of articles under the same title prepared and published by the Institut elektrosvarki imeni Ye.O. Patona (Institute of Electric Welding imeni Ye.O. Paton). The preface is written by B.Ye. Paton, Academician of the Ukrainian Academy of Sciences and Winner of the Lenin Prize. There are no references.

Kazimirov, A. A. [Candidate of Technical Sciences; Institut elektrosvarki imeni Ye. O. Patona (Electric Welding Institute imeni Ye. O. Paton)], and
V. F. Zabotin [Chief Engineer; Khersonskiy sudostroitel'nyy zavod (Kherson Shipbuilding Plant)]. Automatic Welding in Shipbuilding 124

Vakhnin, Yu. N.[Engineer], B. S. Kasatkin [Candidate of Technical Sciences], N. I. Kakhovskiy [Candidate of Technical Sciences], A. M. Ponizovtsev [Engineer; Institut elektrosvarki imeni Ye. O. Patona (Electric Welding Institute imeni Ye. O. Paton)], S. I. German [Candidate of Technical Sciences, Chief of Welding Laboratory; Khar'kovskiy turbinnyy zavod imeni S. M. Kirova (Khar'kov Turbine Plant imeni S. M. Kirov)], and Z. L. Klimovitskiy, Chief of Welding Section; Bryanskiy mashinostroitel'nyy zavod (Bryansk Machinery Plant)]. Carbon-dioxide Shielded Welding in Production of Steam Turbines 137

Zaruba, I. I. [Candidate of Technical Sciences], and A. G. Potap'yevskiy [Senior Engineer; Institut elektrosvarki imeni Ye. O. Patona (Electric Welding Institute imeni Ye. O. Paton)]. Introduction of Automatic and Semi-automatic Carbon-dioxide Shielded Welding 148

Medovar, B. I. [Candidate of Technical Sciences], A. G. Potap'yevskiy [Senior Engineer; Institut elektrosvarki imeni Ye. O. Patona (Electric Welding Institute imeni Ye. O. Paton)], F. A. Ratin [Senior Engineer], S. V. Yunger, Supervisor of the Welding Laboratory; Stalingradskiy filial Giproneftemasha (Stalingrad Branch of State Design and Scientific Research Institute for Petroleum Machinery)], and S. A. Zandberg [Chief of Welding Office; Stalingradskiy mashinostroitel'nyy zavod imeni Petrova (Stalingrad Machinery Plant imeni Petrov)].
Development and Introduction of New Technique in Automatic Submerged-arc Welding of Two-ply Steel With Stainless Chromium Facing 157

Zvonkov, M.L. [Engineer] D. M. Rabkin (Candidate of Technical Sciences; Institut elektrosvarki imeni Ye. O. Patona (Electric Welding Institute imeni Ye. O. Paton)], V. A. Verchenko, (Engineer; trest "Prodmontazh" (Production Assembly Trust)], and I. M. Mirgorodskiy [Chief Engineer; zavod "Bol'shevik" ("Bol'shevik" Plant)]. Experience Gained in Welding Containers Made of Aluminum and Its Alloys 173

Asnis, A. Ye. [Candidate of Technical Sciences; Institut elektrosvarki imeni Ye. O. Patona (Electric Welding Institute imeni Ye. O. Paton)], N. G. Gavrilenko [Engineer], A. V. Prokhorov [Engineer; Zhdanovskiy zavod imeni Il'icha (Plant imeni Il'ich in Zhdanov), and S. V. Yunger [Engineer; Stalingradskiy filial Giproneftemash (Stalingrad Branch of State Design and Scientific Research Institute for Petroleum Machinery)]. High-strength Steels for Weldments 183

AVAILABLE: Library of Congress (TS 227.A359)

VK/fal
5-4-60

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2-3

SOV/180-59-3-11/43

AUTHOR: Kasatkin, B.S. (Kiyev)

TITLE: Network of the Ferrite Grain Substructure and its Influence on the Deformation and Fracture of Technical Iron

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 3, pp 62-69 (USSR)

ABSTRACT: The present paper is dedicated to the study of the characteristics of the internal structure of ferrite grains in connection with the formation of the α-network of ferrite and its influence on the process of plastic deformation and brittle fracture of technical iron. Investigations were carried out on forged billets of technical iron containing 0.05% C, 0.11% Mn, 0.19% Si, 0.03% S, 0.01% P. The billets were heat treated; the initial heating temperature was in every case the same, namely 1100°C, and the soaking time was 1.5 hours. Data available in the literature on the conditions under which the α-network of ferrite is formed and removed were taken into consideration in deciding the heat treatment to be given (Ref 3). The heat treatments applied are shown in the Table, p 62. The author has

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carried out comparative studies of various etching methods and has found that the α-network of ferrite can be exposed clearly not only by the accepted methods but by using electrolytic polishing followed by electrolytic etching (Ref 5). The order in which microsections were prepared was as follows: the microspecimens were thoroughly polished by the usual mechanical method; then electropolishing was carried out in the electrolyte (mixture of 1/20 volume perchloric and glacial acetic acids) at 100 V and a current density of 0.015 A/cm^2 for 2 to 3 sec. Stainless steel was used as the cathode material. The subsequent electrolytic etching was carried out with a methyl alcoholic solution of ferric chloride (0.5%) and hydrochloric acid (1%) at 16 to 20 V and a current density of 0.15 to 0.20 A/cm^2 for 5 to 6 sec. The cathode material again was stainless steel. An investigation of the characteristics of the microstructure of technical iron specimens after various heat treatments was carried out by means of an optical and an electron microscope. Electron microscopic investigations were carried out with the application of

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collodium films. The tendency to brittle fracture was estimated by impact bend tests on standard notched specimens at various temperatures. Besides, for the study of the influence of the α-network on twin formation and micro-crack development a method was used in which the specimens were tested by impact bending in a special iron ring (Ref 6). This method enables the specimen to be deformed to a predetermined degree and the conditions of testing are kept the same as for the normal impact tests. In Fig 1, the network substructure (α-network) of technical iron after annealing (heated to 1100°C, soaked for 2 hours and furnace cooled) is shown. In Fig 2, the structure of the same iron is shown after normalising (heated to 1100°C, soaked for 2 hours and air cooled). In Fig 3, the microstructure of technical iron after quenching (heated to 1000°C, soaked for 2 hours and water quenched) is shown. In Fig 4, the microstructure of technical iron after quenching (heated to 1100°C, soaked for 2 hours and water quenched) and high temperature tempering (heated to 700°C, soaked for 1.5 hours and furnace cooled) is shown. Fig 6 shows the

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dependence of the impact strength a_k(kg/cm^2) of technical iron on temperature after various heat treatments. In Fig 8, the microstructure of technical iron after normalising is shown. Fig 5 is an electron photomicrograph of the structure of ferrite grains with veins of the α-network. The specimen is technical iron as normalised. Fig 7 shows the electron photomicrograph of the ferrite grain structure with the α-network. The specimen is technical iron after annealing. After etching, it was deformed in tension at 20°C. Fig 9 is a photomicrograph of ferrite grains with an α-network and twins. The specimen is technical iron after annealing. It was deformed by impact bending at -100°C. In Fig 10, a ferrite grain exhibiting a microcrack is shown. Fig 11 shows the way the slip line changes at the boundary of adjoining crystals with different crystal lattice orientation. As the slip line changes, a movement of the grain boundary from the position B to position B' and a slip development along the dotted line takes place. The author arrives at the following

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conclusions: 1) The formation of the ferrite α-network (subgrain boundaries) in technical iron is determined by the method of heat treatment. Rapid cooling rates lead to the removal of the network substructure; a decrease in the cooling rate causes an increase in the dimension of separate α-network nuclei and a thickening of the veins of which this network consists. 2) The main reason for the formation of the α-network is the plastic deformation occurring during the $\gamma \rightarrow \alpha$ transformation. However, polygonisation and diffusion processes of such impurities as carbon and nitrogen play a decisive role in the development of the α-network in ferrite grains. The orientation of carbon and nitrogen diffusion within the grains at temperatures of 850 to 700°C and below, exercise a fundamental influence on the formation of the α-network. 3) The network substructure exerts a definite influence on the development of plastic deformation and brittle fracture. The veins of the α-network are obstructions for the development of slip lines of twins and microcracks.

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In this respect they are similar to grain boundaries; however, the extent of their influence on these processes appears to be somewhat less. At a small grain size the presence of an α-network somewhat lowers the critical brittleness temperature and substantially raises the impact strength in the ductile condition. If the grains are very coarse the α-network exerts a more effective influence on the lowering of the critical brittleness temperature and the impact strength characteristics in the ductile condition increase somewhat. There are 11 figures, 1 table and 12 references, 6 of which are Soviet, 5 English and 1 German.

SUBMITTED: July 18, 1958

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SOV/170-59-3-18/20

AUTHOR: Kasatkin, B.S.

TITLE: On the Twinning of Notched Specimens in Impact Bending (O dvoynikovanii pri udarnom izgibe nadrezannykh obraztsov)

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1959, Nr 3, pp 115-118 (USSR)

ABSTRACT: The process of twinning is very often observed in brittle destruction of metals. The question of whether the brittle destruction of cold brittle metals is determined by their ability to mechanical twinning was discussed by several investigators [Ref. 1 to 4] but was not decisively solved. The author undertook a study of the twinning problem by conducting impact bending experiments with notched prismatic specimens made of commercial iron 10 x 10 x 55 mm in size with a standard notch of 1.0 mm in radius. The methods of making deformations of the notched specimens was described in a previous paper of the author [Ref. 5]. The use of the equipment described in that paper makes it possible to deform specimens to a pre-determined magnitude which is established by the value of sagging. The brittle and viscous state of the specimens was regulated by the temperature which was set according to the curve, toughness versus temperature, devised by the serial tests for impact bending. The metallographic studies have

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shown that twinning is observed both in specimens deformed in the brittle as well as in the viscous state. In the latter case, twinning takes place below a determined temperature limit on the ascending section of the curve "toughness versus temperature" pictured in Figure 1. The twinning "threshold" during plastic deformation lay within limits close to 40° and corresponded to the upper inflection point of the curve. In a viscous state the process of plastic deformation by means of slipping (the surface areas at the notch) and twinning (at a certain distance from the notch) takes place simultaneously. Twins formed during the deformation of the specimens in a viscous state are not uniform in width, and are frequently "intercepted". At lower temperatures approaching the critical brittleness temperature the twins become more uniform in width.
There are: 1 graph, 1 set of microphotos, and 6 references, 3 of which are Soviet and 3 German.

ASSOCIATION: Institut elektrosvarki imeni Ye.O. Patona AN USSR (Institute of Electric Welding imeni Ye.O. Paton of the AS UkrSSR), Kiyev

18(3,7)

05288
SOV/170-59-7-19/20

AUTHORS: Kasatkin, ~~B.S.,~~ Darovskiy, G.F.

TITLE: The Fine Structure of Twin Interlayers in Commercial Iron

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1959, Nr 7, pp 106 - 109 (USSR)

ABSTRACT: This article presents investigation results of the fine structure of twin interlayers obtained in the process of brittle fracturing of commercial iron. The study was carried out by means of an electronic microscope, and microphotographs obtained are presented in Figures 1-4. A characteristic feature of the structure of a twinning interlayer is the presence of a narrow central band, approximately 0.5 μ thick which passes through the entire twinning interlayer. The formation of this twin is a first stage in the mechanical twinning process which is a multistage one. Along the twin there are individual depressions which have a fine-grained structure with cells of rectangular shape. They are located in a deformed zone resulting from fault formation and having a width of the order of 2.2 microns. Sometimes deformation bands have fir-tree shape and uniform thickness along their whole length. It is assumed that the formation of deformed zones begins with

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the formation of unit local faults, and a local fault is formed as a result of discharging accumulations of dislocations at some obstacle in the twinning zone. Under the further action of external forces, causing the deformation by twinning, the number of local faults increases, and a series of consecutive faults, partially overlapping each other, is formed.
There are: 4 microphotos and 5 references, 3 of which are Soviet, 1 English and 1 unidentified.

ASSOCIATION: Institut elektrosvarki im. Ye.O. Patona AN USSR (Institute of Electric Welding imeni Ye.O. Paton of the AS UkrSSR), Kiyev.

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18.8200

66894

AUTHOR: Kasatkin, B.S. SOV/126-8-1-11/25

TITLE: Mechanism of Brittle Fracture of Steel in the Impact Bending of Notched Specimens

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 1, pp 75-84 (USSR)

ABSTRACT: The author has studied the micro-mechanism of brittle fracture by investigating the separate stages of brittle fracture in the impact bending of prismatic specimens, 10 x 10 x 55 mm, with a standard notch and a V-shaped notch, 2.0 mm deep, with radius at the bottom of the notch of 0.25 mm. The specimens were made of steel A - Martens steel M18kp after heat treatment (heated at 1100°C for 1.5 hours and furnace-cooled); steel B - the usual hot-rolled Bessemer steel B16kp, 18 mm thick, and steel V - forged billets, 16 mm thick, of technical iron. In order to study the separate stages of brittle fracture a method was used in which specimens were tested in an iron ring (Ref 7). The application of the special iron ring enables specimens to be deformed in impact bending to a definite pre-determined extent. The experiments were carried out in the following order. The specimens

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Mechanism of Brittle Fracture of Steel in the Impact Bending of Notched Specimens

together with the iron ring were cooled at a temperature 20-15°C below the critical brittleness temperature of the materials under investigation, and the specimen in the iron ring was then quickly transferred to the Charpy impact testing machine and was deformed by the impact pendulum (15 kg). The extent of deformation was estimated from the angle of bend and the camber of the specimen. From the deformed specimens longitudinal sections from the centre of the specimen were made. Metallographic investigation of these sections enabled the presence of twins and micro-cracks in separate micro-films under the notch to be confirmed (Fig 1). A local X-ray structural analysis of the sections, after electrolytic polishing, has shown that the preliminary deformation of the specimen in the "brittle state" brings about definite changes in the interference picture of X-ray photographs. X-ray photographs were taken by inverse exposure in a special apparatus in which the diameter of the irradiated spot is 0.10-0-20 mm (Ref 3). X-ray pictures were taken from portions located at the notch, 1.5-2.0 mm from the

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notch and at a considerable distance from the notch. In Fig 3 elementary slip lines and series of micro-cracks in a ferrite grain of steel V at a magnification of X850 are shown. Fig 4 shows the same at a magnification of X750. Fig 5 shows a micro-crack in steel V changing to local plastic deformation. In Fig 6 a local slip from the joint of three grains and a micro-crack along the grain of steel V is shown. Fig 7 shows two twins in steel B with a micro-crack between them. Fig 8 shows the micro-hardness (50 g) of grains of steel B at different distances from the surface of the brittle fracture. In Fig 9 a series of micro-cracks in the impact specimen having the notch before the beginning of the general brittle fracture, is shown. The steel V has been deformed in an iron ring at -40°C. In Fig 10 the dependence of impact strength on temperature of notched specimens is shown. The author arrived at the following conclusions: the process of brittle fracture should be sub-divided into two stages; the first stage is the pre-fracture: its characteristics are plastic deformation,

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and associated with it, grain refining; twin formation; nucleation and the development of micro-fractures along internal micro-volumes of the metal. The second stage is the brittle fracture itself. This stage of fracture commences with the formation of a ductile fracture in a thin surface layer of the metal at the bottom of the notch, the conditions of deformation of which differ sharply from the deformation of the internal micro-volumes. Subsequently fracture follows earlier formed internal cracks which are separated from each other by bridges of partly deformed grains.
There are 10 figures and 13 references, 9 of which are Soviet and 4 English.

ASSOCIATION: Institut elektrosvarki AN UkrSSR (Institute of Electric Welding, Ac.Sc., UkrSSR)

SUBMITTED: June 1, 1957 (Initially)
October 31, 1957 (After revision)

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18.9200

67666
SOV/126-8-6-14/24

AUTHORS: Kasatkin, B.S. and Darovskiy, G.F.

TITLE: Fine Structure of the Intergranular Transition Zones of Technical Iron

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 6, pp 881-884 (USSR)

ABSTRACT: Electron microscopic investigations were carried out on specimens of hot-rolled technical iron which had been subjected to forging and annealing (heating to 1100°C, soaking for 3 hours followed by furnace cooling). Microsections were prepared by electrolytic polishing and etching as described by Kasatkin (Ref 4). The electron microscopic investigations were carried out with the aid of collodion films tinted with chromium, and carbon films. The advantage of the latter is that they enable a sufficiently contrasted picture of the fine structure to be reproduced without supplementary tinting. This is particularly important for the study of the characteristics of a fine crystal structure at large magnifications. Fig 1 shows an electron photomicrograph of two neighbouring grains and the transition zone between them. Fig 2 and 3 show the transition zone

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Fine Structure of the Intergranular Transition Zones of Technical Iron

between grains of comparatively small disorientation relative to each other. The width of the zone is between 0.08 and 0.16 μ. The grains consist of plastic blocks, the boundaries of which represent chains of etch pits. Fig 4 shows an electron photomicrograph of the fine structure of a relatively wide (approximately 0.8 μ) transition zone between two differently orientated grains. Fig 3 shows the fine structure of portions of a few neighbouring grains and the transition zones between them. The electron microscopic investigations agree in the authors' opinion in a certain measure with the model of semi-ordered intercrystalline transition zone suggested by Arkharov and in addition bring out certain details of this model more accurately. The semi-ordered fine structure of the intergranular transition zone in technical iron is made up of blocks. The presence in the grains of blocks outlined by series of dislocations creates favourable conditions for the formation of a block structure in the transition zone and a smooth crystalline contact of this zone with the grains. From the point of view of the semi-ordered intercrystalline

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transition zone model the blocks represent regions having an ordered structure and the block boundaries are layers with a distorted structure. With increased distance from the grains the closeness of the dislocation rows in the transition zone and the dislocation density increase. As suggested by the model, the greatest disturbance in the crystalline order of distribution of atoms occurs in the middle portion of the transition zones. The width of the transition zone and the increase in closeness of the dislocation row net are determined by the orientation relative to each other of neighbouring grains. The greater the disorientation between adjacent grains the wider will be the intergranular transition zone and the greater will be the difference in block size and dislocation density between the peripheral and central portions of this zone. As the formation of intergranular transition zones takes place at high temperatures and appears to be accompanied by plastic deformation (Ref 5 and 6) it must be assumed that the fine structure of this zone is further distorted by polygonization which at high temperatures takes place at

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Fine Structure of the Intergranular Transition Zones of Technical Iron

a considerable rate. There are 4 figures and 6 references, 2 of which are Soviet, 3 English and 1 a translation from English into Russian.

ASSOCIATION: Institut elektrosvarki im Ye.O.Patona AN USSR (Institute of Electric Welding imeni Ye.O.Paton, AS UkrSSR)

SUBMITTED: March 31, 1959, initially
June 4, 1959, after revision

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SOV/125-59-9-2/16

18(5)

AUTHOR: Kasatkin, B.S., Candidate of Technical Sciences and Darovskiy, G.F., Engineer

TITLE: Sub-Structure of Low-Carbon Welds

PERIODICAL: Avtomaticheskaya svarka, 1959, Nr 9, pp 13-16 (USSR)

ABSTRACT: This article deals with the question of the influence of sub-structure on the physico-mechanical properties of iron and steel. In this connection, the authors refer to the works of Academician G.P. Kurdyumov and his co-workers V.A. Il'ina and V.M. Golubkov. Research of welds was carried out on 20 mm thick testpieces welded under powder flux by means of electrode wire containing 0.05% of carbon. On the whole, research of low-carbon welds was performed by an electronic microscope with application of chrome-shaded colloid films; it was disclosed that ferrite grains in welds have both, the micro- and macro substructures. The first is shown in Fig 1, the second - in Fig 5. The veining in ferrite is shown in Fig 2 (optical microscope), and in Fig 3

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(electronic microscope). Most researchers assume that the primary cause of the veining α- net ferrite formation is a result of plastic deformation developed in the process of transformation $\gamma \rightarrow \alpha$. There are grounds for believing that the plastic deformation caused by heating during the welding should by its intensity surpass the deformation connected with the transformation $\gamma \rightarrow \alpha$. Thus, the conditions of crystallization and of the subsequent cooling of metal, which exert a strong influence on plastic deformation, polygonization and diffusion of admixtures, determine the substructural development in ferrite grains. In Fig 4, a microphotograph of a plastically deformed ferrite grain, showing veins of α -net and a series of slide-zones, is given. There are 1 diagram, 6 photographs and 14 references, 10 of which are Soviet and 4 English.

SUBMITTED: March 2, 1959

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66567

~~18 (2, 3, 5)~~ 18.1200 SOV/125-59-11-2/22

AUTHORS: Kasatkin, B.S., Candidate of Technical Sciences, and Vakhnin, Yu.N., Engineer

TITLE: Automatic Carbon Dioxide Shielded Arc Welding of Steel 15Kh1M1F

PERIODICAL: Avtomaticheskaya svarka, 1959, Nr 11, pp 13-19 (USSR)

ABSTRACT: Chrome-molybdenum-vanadium steel 15Kh1M1F is widely used in steam-turbines. It has a high fluidity limit (33-32 kg/mm^2); its limit of lasting durability at 570°C during 100,000 hours is 8.6-9.2 kg/mm^2; creep limit - 5.0 kg/mm^2 at 570°C. When welding, it is recommended to preliminarily heat it up to 300°C, as the process of austenite decomposition in this steel takes a comparatively long period of time. In this article, carbon dioxide shielded arc welding applied to steel 15Kh1M1F is described. The welding was performed by reverse polarity direct current. Conditions of welding were: Current intensity - 320-350 amp; arc voltage - 28-30 volt; electrode feed speed - 18 m/

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hour. Experimental, powder wire electrodes of different chemical compositions were used. When selecting electrodes, the following scientific literature was consulted: [1] B.S. Kasatkin, N.I. Kakhovskiy, and Yu.N. Vakhnin "Automatic Welding of Heat-Resistant Steel 15KhMA in Carbon Dioxide Atmosphere", published in "Avtomaticheskaya svarka", Nr 3, 1957; [2] N.I. Kakhovskiy and A. M. Ponizovtsev "Automatic Welding of Heat-Resistant Steel 20KhMA in Carbon Dioxide Atmosphere", published in "Svarochnoye proizvodstvo", Nr 2, 1958; [3] B.S. Kasatkin and Yu.N. Vakhnin "Welding of Heat-Resistant Steel 20KhMF in Carbon Dioxide Atmosphere", published in "Avtomaticheskaya svarka", Nr 3, 1958; [4] B.S. Kasatkin, N.I. Kakhovskiy and Yu.N. Vakhnin " On the Question of Welding High-Alloy Steel in Carbon Dioxide Atmosphere", published in "Avtomaticheskaya svarka", Nr 5, 1956. Research of weld obtained on steel 15Kh1M1F permitted establishing its optimum chemical composition: not over 0.1% C; 0.85-1% Mn; 0.3-0.4% Si; 1.3-

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Automatic Carbon Dioxide Shielded Arc Welding of Steel 15Kh1M1F

1.5% Cr; 0.9-1.2% Mo; 0.3-0.4% V; not over 0.03% of each S and P. Mechanical properties of weld metal are given in Table 1. On the basis of numerous experiments the following conclusions were drawn: 1) Welding heat-resistant perlite steel 15Kh1M1F can be done by carbon dioxide shielded arc with the application of special electrode wires; the welds obtained possess mechanical properties similar to those of the base metal; lasting durability and the creep limit of weld metal are not lower than those in steel 15Kh1M1F: 2) Welded joints have stable properties and structure at temperatures 570-620°C. There are 3 graphs, 5 tables, 4 photographs and 6 Soviet references.

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki imeni Ye.O. Patona AN USSR (Order of the Red Banner of Labor Institute of Electric Welding imeni Ye.O. Paton AS UkrSSR)

SUBMITTED: April 13, 1959

Card 3/3

KASATKIN, B.S.

PHASE I BOOK EXPLOITATION SOV/4632

Zaruba, Igor' Ivanovich, Boris Sergeyevich Kasatkin, Nikolay Ivanovich Kakhovskiy, and Arkadiy Grigor'yevich Potap'yevskiy

Svarka v uglekislom gaze (Carbon Dioxide Shielded [Arc] Welding) Kiyev, Gostekhizdat, 1960. 223 p. 8,200 copies printed.

Ed.: V. Garkusha; Tech. Ed.: S. Matusevich.

PURPOSE: This book is intended for technical personnel concerned with welding processes.

COVERAGE: The authors discuss the results of research and industrial experience in welding with melting electrodes in a carbon dioxide atmosphere. Certain electric and metallurgical processes which occur in this type of welding are discussed and problems of automatic and semiautomatic welding techniques are considered. The authors describe construction of automatic and semiautomatic welders and present available information regarding their operation. No personalities are mentioned. There are 81 references: 74 Soviet, 6 English, and 1 German.

TAB~~LE OF CONTEN~~TS:
C~~ard 1/4~~

KASATKIN, G.S

PHASE I BOOK EXPLOITATION SOV/4502

Akademiya nauk SSSR. Nauchnyy sovet po probleme zharoprochnykh splavov

Issledovaniya po zharoprochnym splavam, tom 6 (Investigations of Heat-Resistant Alloys, Vol. 6) Moscow, 1960. 319 p. Errata slip inserted. 3,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut metallurgii imeni A. A. Baykova. Nauchnyy sovet po probleme zharoprochnykh splavov.

Editorial Board: I. P. Bardin (Deceased) Academician, G. V. Kurdyumov, N. V. Ageyev, Corresponding Member, Academy of Sciences USSR (Resp. Ed.), I. A. Oding, L. M. Pavlov, and I. F. Zudin, Candidate of Technical Sciences; Ed. of Publishing House: V. A. Klimov; Tech. Ed.: S. G. Tikhomirova.

PURPOSE: This book is intended for research workers in the field of physics of metals and for metallurgists, particularly those working on heat-resistant alloys.

COVERAGE: This collection of 45 articles deals with various problems in the production of heat-resistant alloys. Special attention is paid to the mechanisms of deformation of such metals as aluminum, copper, iron, and nickel. Various defects and failures of metals are analyzed, and means for increasing the heat resistance and plasticity are described. Among the special problems discussed are: electrolytic conductivity of iron-aluminum alloys in the solid state; the mobility of atoms in nickel-iron alloys, depending upon defects of their crystalline structure; the kinetics of change in isolated pores; the irreversible thermal transformation of solid bodies, etc. No personalities are mentioned. References follow each article.

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KASATKIN, B.S.

"White stripe" on weld joints in heat-resistant pearlitic steel.
Issl. po zharopr. splav. 6:223-226 '60. (MIRA 13:9)
(Welding--Defects) (Heat-resistant alloys--Welding)

21916

S/125/60/000/011/011/016
A161/A133

1.2300

AUTHORS: Kasatkin, B.S., and Vakhnin, Yu.M.

TITLE: CO_2-shielded welding of 34KhM steel and its joints to EI415 steel

PERIODICAL: Avtomaticheskaya svarka, no. 11, 1960, 62-66

TEXT: The two steel grades 34XM (34KhM) and ЭИ415 (EI415) are often used for steam turbines. Their composition (in %) is:

Steel	C	Si	Mn	Cr	Mo	V	W	Ni	S not above	P not above
34KhM	0.30--0.40	0.17--0.37	0.40--0.70	0.90--1.30	0.20--0.30	-	-	$\leqslant$0.5	0.035	0.030
EI415	0.16--0.24	$\leqslant$0.4	0.25--0.60	2.4--3.3	0.35--0.55	0.60--0.85	0.30--0.50	$\leqslant$0.5	0.030	0.035

The recommended heat treatment consists in quenching at 750-870°C and tempering at 630-640°C for 34KhM; annealing at 950-960°C, normalization at 1050-

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S/125/60/000/011/011/016
A161/A133

CO_2-shielded welding of 34KhM steel...

1100°C, quenching at 1020-1050°C in oil, and tempering in 660-680 C for EI-415. The Electric Welding Institute im.Paton has obtained welded joints with high mechanical properties in 24-26 mm deep base metal by preliminary and simultaneous heating to 350°C, welding in 10-12 passes with Св-08ХГСМФА (Sv-08KhGSMFA) welding wire of 2 mm diameter and 3 mm powder wire, 350-370 amp and 28-30 volt current, and 16 m/h welding speed. The hardness of the joints after tempering at 640° was 190-270 HB, and this tempering temperature was chosen for both kinds of joints. The fatigue strength of the weld metal was higher than required by the specifications and approached that of base metal. The endurance limit at 480° was 20 kg/mm^2 and met the requirements for34KhM steel. The following conclusions are made: 1) CO_2-shielded arc welding can be used for joints of 34KhM steel and unions of the 34KhM and EI415 steel grades. The new technology ensures properties near the 34KhM base metal in weld metal and welded joints. Welded joints have a high endurance limit at 480° and a high fatigue strength. 2) The Св-08ХГСМФА (Sv-08KhGSMFA) electrode wire according to ЧМТУ ЦНИИЧМ 166-59 (ChMTU-TsNIIChM 166-59) specifications is recommended for joints of 34KhM steel and unions between the 34KhM and EI415 steels. There are 3 figures and 5 Soviet references.

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CO_2-shielded welding of 34KhM steel... S/125/60/000/011/011/016
A161/A133

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki im.Ye.O.Patona AN USSR ("Order of the Red Banner of Labor" Electric Welding Institute im.Ye.O.Paton of the Academy of Sciences of the Ukrainskaya SSR

SUBMITTED: May 9, 1960

X

Card 3/3

KASATKIN, B.S. (Kiyev)

Local plastic deformation with brittle failure of commercial iron. Izv. AN SSSR. Otd. tekh. nauk. Met. i topl. no.1:108-116 Ja-F '61. (MIRA 14:2)

(Iron--Metallography) (Deformations (Mechanics))

KASATKIN, B.S.

Characteristics of the fine structure of deformation bands in commercial iron. Fiz. met. i metalloved. 11 no. 5:767-774 My '61.
(MIRA 14:5)

1. Institut elektrosvarki imeni Ye.O. Patona AN USSR.
(Iron—Metallography)

S/125/62/000/006/004/013
D040/D113

AUTHORS: Kasatkin, B.S., and Musiyachenko, V.F.

TITLE: Oxidizing AN-17 flux for welding carbon and low-alloy steel

PERIODICAL: Avtomaticheskaya svarka, no.6, 1962, 21-25

TEXT: The AH-17 (AN-17) flux has been developed for CO_2 welding with Si-Mn welding wire in attempts to find a flux composition producing a low content of nonmetallic inclusions and gases in welds on carbon and low-alloy steel. The flux, which contains active iron oxides and small quantities of SiO_2 and MnO, was melted in an electric furnace, granulated in a water bath, and dried. The oxidizing effect greatly depends on the FeO content which varied between 1 and 10%. On raising the FeO content, Si oxidized most intensively, Mn less intensively, and Cr, Mo and V only slightly. The oxidation of C seems to improve the liberation of gases and nonmetallic inclusions from the metal. The oxidation-reduction reactions are very vigorous, and the chemical composition of the weld metal only slightly depends on the data of welding. The percentage composition

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S/125/62/000/006/004/013
D040/D113

Oxidizing AN-17 flux for welding carbon .....

of the Св-08ХГСМФ (Sv-08KhGSMF) and Св-08Г2СА (Sv-08G2SA) wires used together with the AN-17 flux is as follows: 0.09 C, 0.81 Si, 1.6 Mn, 0.95 Cr, 0.6 Mo, 0.3 V, 0.023 S, 0.020 P, and 0.08 C, 0.87 Si, 1.81 Mn, 0.024 S, 0.018 P. The content of nonmetallic inclusions and gases in the weld metal produced with these wires and the AN-17 flux was considerably lower than in welding with an АН-348А (AN-348A) flux, and the mechanical properties of welds in the 20-600°C range fully met the standard requirements. The flux is now being tested with other wire grades, and is recommended for use. There are 6 figures and 3 tables.

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki im. Ye.O.Patona AN USSR (Electric Welding Institute "Order of the Red Banner of Labor" im. Ye.O.Paton, AS UkrSSR)

SUBMITTED: December 22, 1961

Card 2/2

KASATKIN, B. S. (Kiyev); STRIZHEUS, Zh. N. (Kiyev)

"Step" formation on fracture surfaces during the brittle failure of commercial-grade iron. Izv. AN SSSR. Otd. tekh. nauk. Met. i topl. no.6:112-124 N-D '62. (MIRA 16:1)

(Iron—Brittleness) (Electron microscopy)

GERMAN, Semen Iosifovich; KASATKIN, B.S., doktor tekhn. nauk, retsenzent; SINGOYEVSKIY, K.V., red.; GORNOSTAYPOL'SKAYA, M.S., tekhn. red.

[Electric arc welding of pearlitic class heat-resistant steel] Elektrodugovaia svarka teploustoichivykh stalei perlitnogo klassa. Moskva, Mashgiz, 1963. 216 p. (MIRA 16:8)
(Chromium-molybdenum steel--Welding)
(Steel, Heat-resistant--Welding)

KASATKIN, B.S.; TSARYUK, A.K.; MUSIYACHENKO, V.F.

Fluxes for the mechanized welding of 12Kh1MF heat-resistant steel. Avtom. svar. 16 no.8:26-33 Ag '63. (MIRA 16:8)

1. Institut elektrosvarki imeni Ye.O. Patona AN UkrSSR.
(Steel, Heat-resistant—Welding)
(Flux (Metallurgy))

KASATKIN, B. S.

"Characteristiques de la rupture et de la deformation par fluage des joints soudes."

report submitted for 17th Annual Assembly, Intl Inst of Welding, Prague, Jul 64.

KASATKIN, Boris Sergeyevich, doktor tekhn. nauk; YERMENKO, V.K., inzh., retsenzent;

[Mechanized welding of steel under flux] Mekhanizirovannaia svarka stali pod fliusom. Kiev, Tekhnika, 1964. 109 p. (MIRA 17:8)

KASATKIN, Boris Sergeyevich, doktor tekhn. nauk; LYSAK, L.I., doktor tekhn. nauk, retsenzent

[Structure and the micromechanism of brittle failure in steel] Struktura i mikromekhanizm khrupkogo razrusheniia stali. Kiev, 1964. 263 p. (MIRA 17:10)

Sergeyevich (Doctor of Technical Sciences)

... micro-mechanism ...
... khrupkogo razrusheniya stali). Kiev, Izd-vo "Tekhnika", 196?,
... illus., biblio. 1,950 copies printed.

TOPIC TAGS: low carbon steel, brittle failure, plastic deformation, dislocation ... sensitivity, crystallography

... CONTENTS [abridged]:

Card ... /4

re ... low carbon steel -- ...

... of the dislocation ...

... in impact bending -- ...

NO REF SOV: 123 OTHER: 080

ALOV, A.A.; KASATKIN B.S., doktor tekhn. nauk, retsenzent

[Principles of the theory of welding and soldering processes] Osnovy teorii protsessov svarki i paiki. Moskva, Mashinostroenie, 1964. 272 p. (MIRA 17:12)

KASATKIN, B.S.; MUSIYACHENKO, V.F.

Selection of flux and electrode wire for the welding of high strength, low-alloy steel. Avtom. svar. 17 no.8:1-10 Ag '64. (MIRA 17:11)

1. Institut elektrosvarki imeni Patona AN UkrSSR.

KASATKIN, B.S.; STRIZHIUS, Zh.N.; SLADKOVA, V.N.

Micromechanism of the brittle fracture of large samples.
Avtom. svar. 17 no.12:1-7 D '64 (MIRA 18:2)

1. Institut elektrosvarki im. Ye.O.Patona AN UkrSSR.

(Doctor of technical sciences)

TAGS: cold brittleness, steel cold brittleness, steel hair crack, brittle failure,

Card 1/4

ACCESSION NR: AT5008301

... in the experimental field due to difficulties in working out new test methods. ... the crystal ...

Card 2/4

plane. The formation of hair cracks ... local plastic deformation occurs at the end of the crack and hair crack growth is ... given for the energy of the developing crack. A certain critical ...

... that the consumption of energy ... main part of the total surface plastic ...

Thus, transition from viscous failure to brittle failure depends on the metal [illegible] [illegible] on the elastic-plastic deformation. Visible signs of appearance of hair cracks [illegible] above the critical brittleness temperature. Brittle

ACCESSION NR:

2 formulas.

ASSOCIATION: Institut elektrosvarki im. Ye. O. Patona AN UkrSSR (Institute of Electric Welding, AN Ukr SSR)

Card 4/4

PATON, B.Ye., akademik, otv. red.; ASNIS, A.Ye., doktor tekhn. nauk, red.; KAZIMIROV, A.A., kand. tekhn. nauk, red.; KASATKIN, B.S., doktor tekhn. nauk, red.; RAYEVSKIY, G.V., doktor tekhn. nauk, red.; TRUFYAKOV, V.I., kand. tekhn. nauk, red.; SHEVERNITSKIY, V.V., kand. tekhn. nauk red.[deceased]; GILELAKH, V.I., red.

[Design of welded strukturesş reports] Proektirovanie svarnykh konstruktsii; doklady. Kiev, Naukova dumka, 1965. 426 p. (MIRA 18:6)

1. Vsesoyuznaya konferentsiya po proyektirovaniyu svarnykh konstruktsii, Kiev, 1963.

...ties of plastic deform...

Avtomaticheskaya svarka, no. 2, ...

welding, steel welding, ...

The results of metallographic ... temperature

... iron ...

... temperature welding ...

... pictures

Card 1/2

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000721010004-6"

L 41055-65
ACCESSION NR: AP5005609

[illegible] of the steel and also on welding conditions. Under identical welding [illegible]

[illegible] figures.

[illegible] electrosvarki [illegible] institute of [illegible]

SUBMITTED: 09Nov64 ENCL: 00 SUB CODE: MM

NO REF SOV: 009 OTHER: 00[illegible]

Card 2/2

[illegible]

[illegible] conductivity, stress analysis, [illegible] analysis, temperature

[illegible] temperature distribution of stress in given [illegible] heated by a [illegible] source. The stresses were very intense [illegible] the point [illegible]

[illegible] was measured by [illegible]

of the heated materials are shown, along with isoclinal curves for [illegible]. The principal stresses σ_1 and σ_2 are also plotted, and equations for σ_x, σ_y and τ_{xy} are

Card 1/2

ACCESSION NR: AP5016015

a radial coordinate system. Finally, an analysis is given for the ... of a heat source. For a moving heat point, the stress-temperature field is ... isotherm moving at the same ...

... the stress gradients in welding. ... figures.

... Institut elektrosvarki ... (Institute of Elec-

... 21Jan65 ENCL: 00 SUB CODE: MM, TD

NO REF SOV: 007 OTHER: 003

Card 2/2

L 28469-66 EWT(m)/EWA(d)/EWP(v)/T/EWP(t)/ETI/EWP(k) IJP(c) JD/HM/HW

ACC NR: AP6010138 (N) SOURCE CODE: UR/0125/66/000/003/0007/0010

AUTHOR: Kasatkin, B. S.; Kazymov, B. I., Onopriyenko, V. P.

ORG: Institute of Electric Welding im. Ye. O. Paton, AN UkrSSR (Institut elektro-svarki im. Ye. O. Patona AN UkrSSR)

TITLE: Resistance butt welding of thick-walled tubes of heat-resistant steels

SOURCE: Avtomaticheskaya svarka, no. 3, 1966, 7-10

TOPIC TAGS: steel, resistance welding, butt welding, flash welding, metal tube / / 12Kh1MF Cr-Mo-V steel

ABSTRACT: Normally resistance butt welding is confined chiefly to small-diameter tubes (up to 100 mm) with wall thickness of not more than 5 mm, because of its high power requirement, irregular heating of the metal and the need to use unique machines weighing as much as 100 tons and more. In this connection, the authors show that these technical difficulties may be largely overcome by resorting to continuous flash welding with programmed control of principal parameters, as illustrated by the results of the experimental continuous flash welding of plates of 12Kh1MF steel 20-60 mm thick with a cross sectional area of 3000-12,000 mm^2 and tubes of 273x38 mm diameter. (Chemical composition of 12Kh1MF steel: 0.1% C, 0.44% Mn, 0.37% Si, 1.05% Cr, 0.3% Mo, 0.27% V). The welded tube joints were tested with satisfactory results for

 UDC: 621.791.762:621.9.462

L 28469-66

ACC NR: AP6010138

static bending, tension, impact strength, and stress-rupture strength at high temperatures (585°C). Of the various types of heat treatment tested, normalizing at 940°C for 30 min proved to be most effective, as it increased impact strength to 11.2 kg-m/mm^2. The welding regimes were based on standard programs for variation in voltage and welding rate (Fig. 1) employed in the continous resistance flash welding of low-

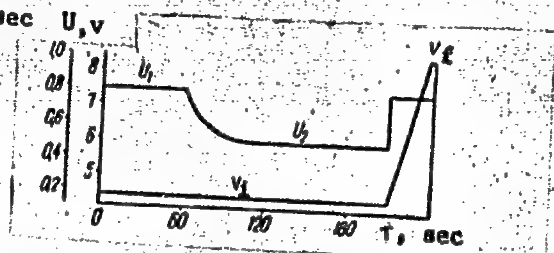

Fig. 1. Programs of variation in voltage and welding rate during the welding of tubes with 273-38 mm diameter:

U_1 - initial voltage; U_2 - minimal voltage; v_i - initial fusion rate; v_f - final fusion rate

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L 28469-66

ACC NR: AP6010138

-carbon steel products with a large cross-sectional area. Since the removal of internal flash caused special difficulty, a device was developed for this purpose: prior to welding, steel cups for collecting the spattered metal are inserted in the tube at a distance of 20-30 mm from the butts to be joined; a hydraulically operated cutting device attached to the steel cups shears off and removes the flash. The welded joints thus obtained are of a strength that is uniform and virtually the same as that of the base metal, and this whole technique is distinguished by its low power requirement, high productivity, and assurance of stable quality. Orig. art. has: 6 figures, 1 table.

SUB CODE: 11, 13/ SUBM DATE: 25Mar65/ ORIG REF: 003/

Card 3/3 LC

L 40800-66 EWT(k)/EWT(m)/T/EWP(v)/EWP(t)/ETI IJP(c) JD/HM

ACC NR: AP6021005 SOURCE CODE: UR/0125/66/000/006/0045/0047

AUTHOR: Ivanenko, V. D.; Kasatkin, B. S.; Dynnikov, O. N. 46 B

ORG: Institute of Electric Welding im. Ye. O. Paton, AN UkrSSR (Institut elektrosvarki im. Ye. O. Patona AN UkrSSR)

TITLE: Welding of the swivel-butt joints of thick-walled steam lines without using backing rings

SOURCE: Avtomaticheskaya svarka, no. 6, 1966, 45-47

TOPIC TAGS: pearlitic steel, metal joining, steam auxiliary equipment, welding technology / 12KhlMF pearlitic steel

ABSTRACT: At boiler-building plants thick-walled steam lines of carbon and low-alloy steels are chiefly welded with the aid of backing rings; this occasionally involves the formation of tears and cracks at the site of fusion between the base metal and the backing ring in the course of operation of the steam line. In this connection, the authors investigated the possibility of the CO_2-shielded horizontal girth welding of vertical swivel-butt joints of carbon and low-alloy steels (such as 12KhlMF type pearlitic heat resistant steel) without backing rings.

Card 1/2 UDC: 621.791.8:621.643.23

L 40800-66

ACC NR: AP6021005

The best results were obtained when the electrode was positioned at the angle of 10-15° to the horizontal plane (Fig. 1), with the tube rotating at a low speed (3-6 m/hr), in the presence of a welding current of 100-120 a and voltage of 20-21 v. The welding is accomplished with the aid of sweeping transverse back-and-forth movements of the electrode wire in contact with the hot built-up metal of the weld; this assures a slow and uniform cooling of the fine

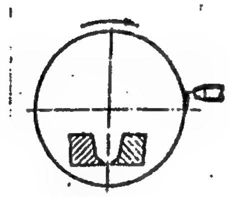

Fig. 1. Build-up of root weld

columnar crystals and hence also a high resistance to cracking. Orig. art. has: 6 figures.

SUB CODE: 11, 13/ SUBM DATE: 12Feb66/ ORIG REF: 006/

Card 2/2

SOV/65-58-12-2/16

AUTHORS: Karzhev, V. I; Kasatkin, D. F. and Orochko, D. I.

TITLE: Hydrogenation of Heavy Petroleum Residues and Secondary Distillates (Gidrogenizatsiya tyazhelykh neftyanykh ostatkov i distillyatov vtorichnogo proiskhozhdeniya)

PERIODICAL: Khimiya i Tekhnologiya Topliv i Masel, 1958, Nr 12, pp 3 - 9, (USSR)

ABSTRACT: Methods for processing petroleum are based on the thermal and catalytic conversions of hydrocarbons. During this process, however, the yield of cracking residues and goudrons as well as distillates with lower hydrogen content, and of inferior quality gases, is increased. This is particularly undesirable during the processing of sulphur-containing petroleums. Disadvantages of destructive hydrogenation processes are pointed out. Comparative rates of liquid phase hydrogenation of various types of raw material at a pressure of 300 atms are given in Table 1. During the hydrogenation of the cracking residue, the reaction volume is decreased to 41 - 66%, (in comparison to petroleum residues obtained by direct distillation) and to 57 - 80% when heavy fractions of coke distillates are hydrogenated. Technical and economical aspects of hydrogenation processing can be improved

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by the modification of the liquid phase stage, and by using it in conjunction with other methods such as catalytic and thermal cracking processes. A further reduction of the reaction volume was achieved by using a one-stage liquid phase hydrogenation, and by using suspended and stationary catalysts. The output of the liquid phase hydrogenation plants was increased to 55 - 60%. The hydrogenation of unsaturated hydrocarbons, oxygen- nitrogen- and sulphur-containing compounds and of resinous substances, as well as the destructive hydrogenation with simultaneous cleavage of the molecule, can proceed at low pressures during the destructive hydrogenation process. Strongly aromaticised kerosine-gas-oil and high boiling distillates, with a high sulphur content, are obtained when using the aforementioned processes. Even more highly aromaticised products are obtained by selective extraction of oil and gas-oil fractions. At present, these products are used as additives for petroleum residues used for heating, for diesel fuels etc. which leads to a decreased yield of valuable motor fuels. These products can be converted to motor fuels by lowering their content

SOV/65-58-12-2/16

Hydrogenation of Heavy Petroleum Residues and Secondary Distillates

of aromatic sulphur compounds and unsaturated hydrocarbons. Low boiling and slightly aromatisised distillates with an increased sulphur content can be converted comparatively easily to fuels by catalytic hydropurification at pressures varying between 20 - 50 atms. Results of the hydrogenation of characteristic fractions, obtained during the catalytic cracking of heavy distillates, and of extracts obtained during the selective purification of oil fractions over a stationary very active catalyst, are discussed (Table 2). Satisfactory results were obtained with tungsten- or tungsten-nickel sulphide catalysts at 200 - 300 atms pressure and at a temperature of 320 - 400°C. Hydrogenates and their fractions, obtained under these conditions, differ in their chemical composition from the starting material as they contain large quantities of naphthenic hydrocarbon (60 - 70%), small quantities of aromatic compounds (from 6 to 10 - 12%), unsaturated hydrocarbons (1 - 2%) and only about 0.1% sulphur. Fractions boiling up to 300 - 350°C have comparatively high density, low freezing temperature and high calorific value. Fractions boiling above this temperature can be used as starting material for catalytic cracking and for

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the preparation of lubricants with a high viscosity index (Table 3). The consumption of hydrogen during the hydrogenation of heavy petroleum residues and of distillates constitutes 3.0 - 4.0%/weight of the starting material. The hydrogenates can be used for diesel and reactive fuels. Properties of the fractions boiling between 200 and 300°C, obtained from hydrogenates during the processing of a highly aromatic extract, are given. Both fractions have the same composition, but different freezing temperatures, which is explained by the different structure of the compositions. Products with analagous properties were also obtained from other aromatic raw materials (extracts of aromatic hydrocarbons obtained during the catalytic cracking of gas-oil; kerosine-gas-oil fractions obtained by direct distillation and fractions obtained during pyrolysis). The qualities of the fractions can be improved by a slight variation in the process conditions; for instance during the hydrogenation of the aforementioned raw materials over a tungsten or tungsten-nickel catalyst

SOV/65-58-12-2/16

Hydrogenation of Heavy Petroleum Residues and Secondary Distillates

gasolines with low anti-detonating properties are obtained. Their octane number does not exceed 52 - 56 units. This can be increased to 84 by using a specially treated catalyst and increasing the process temperature. During this process, high pressures can be used more effectively when using active stationary catalyst than when using suspended catalyst. The degree of conversion of high boiling fractions into light products reaches 65 - 85% when increasing the rate of supplying the raw material, and is two to three times higher than during the liquid-phase hydrogenation with an iron catalyst. There are 4 Tables and 8 Soviet References.

ASSOCIATION: VNII NP

CARD 5/5

SOV/65-58-12- 4/16

AUTHORS: Goncharova, N. V; Krivozubova, N. V; Yevseyev, G. D; Voytekhov, A. A; Kasatkin, D. F. and Karzhev, V. I.

TITLE: Preparation of Products with a High Aromatic Hydrocarbon Content by Hydrogenation (Polucheniye produktov s vysokim soderzhaniyem aromaticheskikh uglevodorodov metodom gidrogenizatsii)

PERIODICAL: Khimiya i Tekhnologiya Topliv i Masel, 1958, Nr 12, pp 15 - 21 (USSR)

ABSTRACT: Processes for the hydrogenation of high-molecular liquid products and solid fuels are very important for the manufacture of motor fuels. The authors investigated the hydrogenation of two samples of crude over a specially treated catalyst, and showed that the end-products contained a high amount of aromatic hydrocarbons. The process was carried out in a laboratory apparatus with a 1.5 litre reactor working at pressures up to 700 atms.(Fig 1). The broad fraction of a liquid phase hydrogenate of tar obtained by semi-coking of Cheremkhovsk coal, and the gas-oil fraction boiling between 160 - 280°C obtained by catalytic cracking of the vacuum distillate of S-petroleum, were used as starting materials. Their

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physico-chemical characteristics are given in Table 1. Bicyclic aromatic hydrocarbons are converted over a chromium catalyst, at temperatures above 460°C, and at hydrogen pressures from 300 - 600 atms into monocyclic hydrocarbons in high yields. These compounds, with long side chains, are dealkylated and simpler homologues of benzene are formed at 500°C and a pressure of 300 atms. The hydrogenate contained a fraction boiling up to 180°C which equalled approximately 46%; benzene formed 23% of this fraction. The quantity of the initial decalin in this mixture remained practically unchanged. Variations in the activity of the catalyst are shown in a graph (Fig.2). A series of experiments was carried out to determine the reaction kinetics with fresh material up to its dephenolisation when the pressure of hydrogen equalled 600 atms, at various temperatures and various volume rates (Fig.3). Results are given in the form of kinetic isotherms (Fig.4). On comparing these isotherms it can be seen that the highest yields of aromatic hydrocarbons are obtained at a temperature of 500°C and a volume rate of 0.5 - 0.7 kg/litre $hour^{-1}$. At pressures

SOV/65-58-12-4/16

Preparation of Products with a High Aromatic Hydrocarbon Content by Hydrogenation

of 300 atms the yield of hydrogenate constituted 87% and contained 71% of the fraction boiling at 160°C and 56% of sulphonated hydrocarbons boiling at the same temperature. At 600 atms pressure slightly less satisfactory results were obtained. Results of laboratory tests on three samples, which were carried out at almost optimal conditions, are listed (Table 2). Table 3 gives the content of aromatic hydrocarbons in hydrogenation products. The octane number of the pure fraction equals 81.3 and is increased to 86.8 when 1 ml/kg of P-9 is added. Further investigations concerned the effect of the chemical composition of the starting material; these were carried out on fractions boiling between 160 - 280°C. The hydrogenates contained a large quantity of aromatic hydrocarbons (up to 70%). A 68% yield of the fraction boiling at 160°C, with a 68% content of aromatic hydrocarbons was obtained on processing gas-oil. It was found that the chemical composition of the initial material hardly affects the

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Preparation of Products with a High Aromatic Hydrocarbon Content by Hydrogenation

yield of C_6 - C_8 aromatic hydrocarbons. Table 5: results of hydrogenation of different types of raw material. There are 5 Tables, 4 Figures and 10 References: 5 English, 1 German and 4 Soviet.

ASSOCIATION: VNII NP

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KASATKIN, D. [F.]

TECHNOLOGY

PERIODICAL: CHEMICKY PRUMYSL, VOL. 8, no. 11, 1958

Kasatkin, D. Hydrogenation of heavy petroleum distillates and residue from thermal and catalytic cracking. Tr. from the Russian. p. 571.

Monthly List of East European Accessions (EEAI), LC, Vol. 8, no. 5, May 1959, Unclass.

KARZHEV, V.I.; KASATKIN, D.F.; BULEKOVA, Ye.A.

Uses of quinoline from the by-product coke industry. Koks i khim. no. 5:50-52 '61. (MIRA 14:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po pererabotke nefti i gaza i polucheniyu iskusstvennogo zhidkogo topliva.
(Quinoline)

KARZHEV, V.I.; KASATKIN, D.F.; SHAVOLINA, N.V.; KUZINA, T.A.

Extraction of aromatic hydrocarbons by propylene carbonate. Khim.i tekh.topl.i masel 6 no.4:6-9 Ap '61. (MIRA 14:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po pererabotke nefti i gazov i polucheniyu iskusstvennogo zhidkogo topliva.
(Hydrocarbons) (Extraction(Chemistry))

KASATKIN, D.P.

Some results of geophysical prospecting in northern Turkmenia. Razved.i okh.nedr 21 no.6:34-43 N-D '55. (MLRA 9:12)

(Turkmenistan--Prospecting--Geophysical methods)

KASATKIN, D.P.

Separation of local gravity anomalies in northern Turkmenia. Razved. i okh. nedr 23 no.6:25-37 Je '57. (MIRA 11:2)

1. Zapadnyy geofizicheskiy trest.
(Turkmenistan--Gravity)

KASATKIN, D. P. Cand Geol-Min Sci -- (diss) "The geological structure of northern Turkmeniya and Karakalpakiya according to data of geophysical studies." Mos, State Sci and Tech Publishing House of Literature on Geology and the ~~Preservation~~ Conservation of Mineral Resources, 1959. 20 pp (Main Geol Administration under the Council of Ministers RSFSR. ("Geofizneftеuglerazvedka" Trust. Min of Geology and Mineral Conservation USSR.) All-Union Sci Res Geol Prospecting Petroleum Inst (VNIGNI)), 150 copies (KL, 45-59, 144)

KASATKIN, D.P.

Results of refraction shooting. Razved. i okh. nedr 26 no.2: 33-38 Feb. '60. (MIRA 14:6)

1. Trest Geofiznefteuglerazvedka.
(Seismic prospecting)

KASATKIN, D.P.

Structure of the platform cover in northeastern Turkmenia. Geol. nefti i gaza 5 no. 5:38-52 My '61. (MIRA 14:4)

1. Trest Geofiznefteuglerazvedka.
(Turkmenia--Geology)

KASATKIN, D.P.

Method of studying the Moscow syneclise. Geofiz. razved. no.6:84-86 '61. (MIRA 15:4)

(Moscow Basin--Petroleum geology)
(Moscow Basin--Gas, Natural--Geology)
(Prospecting--Geophysical methods)

KASATKIN, D.P.

Scales and accuracy of gravimetric surveys. Geofiz. razved. no.3:92-97 '61. (MIRA 17:2)

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000721010004-6"

KASATKIN, D.P.

Methods of geological interpretation of gravity and magnetic surveys in a 1:200000 scale. Geofiz. razved. no.12:22-47 '63. (MIRA 16:11)

NEVOLIN, N.V.; KASATKIN, D.P.; KIREYCHEV, V.D.; KANDINOV, N.N.; LEVITON, M.Ye.; RTISHCHEVA, V.F.; TROITSKIY, V.N.; DYUKOV, A.I.

Structure of the recent relief of the surface basement of the Russian Platform. Sov.geol. 8 no.2:82-90 F '65.
(MIRA 18:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut geofizicheskikh metod razvedki.

ACC NR: AP7008911 SOURCE CODE: UR/0215/66/000/010/0069/0078

AUTHOR: Kasatkin, D. P.

ORG: "Geofizneftegeuglerazvedka" Trust (Trest "Geofizneftegeuglerazvedka")

TITLE: Geological results of an aeromagnetic survey of the southeastern part of the Russian platform and its folded margins

SOURCE: Sovetskaya geologiya, no. 10, 1966, 69-78

TOPIC TAGS: geomagentism, tectonics

SUB CODE: 08

ABSTRACT:
The most important structural-tectonic elements of the southeastern part of the Russian platform are the southeastern part of the Ukrainian uplift and the Caspian depression and the adjoining parts of the Volga-Ural uplifts, Voronezh uplift and the system of depressions of the Cis-Ural downwarp. The region is bordered by the Cis-Caucasian-Kopet Dag epi-Hercynian platform, the western part of the Tien Shan, Southern Urals and southern part of the Turgay downwarp. It is this area which is discussed in this paper. On the basis of the intensity and character of the magnetic field the region is divided into five regions: Southern, Voronezh, Ural-Turgay, Central and Ust-Yurt. Fig. 1 is a map of ΔT_a anomalies for this area; Fig. 2 is a map of the area's regionalization of the magnetic field showing its relative intensity and the strike of the anomalies. The data shown on these maps (discussed in detail in the text) yield much data on the structure of the crystalline basement of the southeastern part of the Russian platform and its marginal regions. A number of geological assumptions and hypotheses have been

UDC: 550.389(47-12)

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ACC NR: AP7008911

confirmod or refuted on the basis of these data and much new structural and tectonic information has been derived. For example, aeromagnetic survey data, as reflected in the maps, confirms that the Donbas and Mangyshlak bolong to a single geomagnetic zone and that they are tectonically interrelated. Along the line Astrakhan'-Aktyubinsk the depths to the crystalline basement vary from 6 to 10 km, not 14 to 20 km as in adjacent regions. Accordingly, the mentioned region is the best site for superdeep drilling for petroleum and gas in the Caspian and Ust-Yurt depressions. Orig. art. has: 2 figures. [JPRS: 39,718]

Card 2/2

KASSATKINE, E.

"Au sujet de la bilirubinemie." Kassatkine, E., et Bielobrov, N. (p. 622)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1940, Volume 18, no. 1.

KASATKIN, E. V.

5(4) PHASE I BOOK EXPLOITATION SOV/2216

Soveshchaniye po elektrokhimii. 4th, Moscow, 1956.

Trudy...; [sbornik] (Transactions of the Fourth Conference on Electrochemistry; Collection of Articles) Moscow, Izd-vo AN SSSR, 1959. 868 p. Errata slip inserted. 2,500 copies printed.
Sponsoring Agency: Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk.

Editorial Board: A.N. Frumkin (Resp. Ed.) Academician, O.A. Yesin, Professor; S.I. Zhdanov (Resp. Secretary), B.N. Kabanov, Professor, S.I. Zhdanov (Resp. Secretary); B.N. Kabanov, Professor; Ya. M. Kolotyrkin, Doctor of Chemical Sciences; V.V. Losev, P.D. Lukovtsev, Professor; Z.A. Solov'yeva; V.V. Stender, Professor; and G.M. Florianovich; Ed. of Publishing House: N.G. Yegorov; Tech. Ed.: T.A. Prusakova.

PURPOSE: This book is intended for chemical and electrical engineers, physicists, metallurgists and researchers interested in various aspects of electrochemistry.

COVERAGE: The book contains 127 of the 138 reports presented at the Fourth Conference on Electrochemistry sponsored by the Department of Chemical Sciences and the Institute of Physical Chemistry, Academy of Sciences, USSR. The collection pertains to different branches of electrochemical kinetics, double layer theories and galvanic processes in metal electrodepositon and industrial electrolysis. Abridged discussions are given at the end of each division. The majority of reports not included here have been published in periodical literature. No personalities are mentioned. References are given at the end of most of the articles.

Ksenzhek, O.S., and V.V. Stender (Dnepropetrovsk Institute of Chemical Technology imeni F.E. Dzerzhinskiy). Polarization of Graphite Electrodes During the Anodic Separation of Chlorine 823

Buyanova, N. Ye., and G.A. Tsyganov (Institute of Chemistry, Academy of Sciences, UzSSR). Hydrogen Overvoltage at Electrodes With Homogeneous Surface 827

Rakov, A.A., K. I. Nosova, and E.V. Kasatkin (Physicochemical Institute imeni L. Ya. Karpov). Mechanism of the Simultaneous Electrochemical Formation of Persulfuric Acid, Ozone and Oxygen at a Platinum Anode in Sulfuric Acid Solutions 834

Volkov, G.I., Z. L. Klitsa, Ye. K. Susorova and N. V. Cheremisina. Influence of Surface-Active Substances on the Rate of Decomposition of Sodium Amalgams 841

Il'in, G. G., and V.I. Skripchenko (Novocherkassk Polytechnic

Card 33/34

Transactions of the Fourth Conference (Cont.) SOV/2216

Institute imeni S. Ordzhonikidze). Influence of the Nature of an Electrolytic Cation on the Anode Process During the Electrolysis of Alkaline and Alkaline-Earth-Metal Chloride Solutions 845

Voronin, N.N. (Deceased), B. G. Prikhodchenko, A.A. Yedigaryan, G. V. Izbekova, I. G. Pavlenko, Ye. Kh. Ignatenko, and S.Y. Trachuk (Kiyev Polytechnic Institute). Electrolytic Reduction of Oxygen at Porous Cathodes 849

Discussion [N. A. Fedotov, R.I. Kaganovich, Ye. M. Kuchinskiy, G.N. Kokhanov, and contributing authors] 856

AVAILABLE: Library of Congress

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9-30-59

Card 34/34

AUTHOR: Kasatkin, E.V. 32-24-4-10/67

TITLE: An Amperometric Method of Determining the Ozone Concentration in a Gas Flow (Amperometricheskiy metod opredeleniya kontsentratsii ozona v gazovom potoke)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 4, pp. 407-409 (USSR)

ABSTRACT: The method described is based on a suggestion made by K.I.Nosova and A.A. Rakov for the determination of the ozone concentration in acid solutions, in electrochemical reduction on a revolving platinum microelectrode at voltages below + 1.6 V. As may be seen from a schematical drawing, the apparatus, as usual, consists of a platinum electrode (with 2000 revs p.minute), the electrolyte (a 1 molar sulphuric acid) and a feed for the gas mixture which leads in to the electrolyte near the electrode. PbO_2 in 1 molar sulphuric acid was used as an electrode for comparison, whilst a self-writing automatic potentiometer of the type EPP-09 was used for recording. Measurements of ozone concentration were carried out at + 1.0 V, because in the case of a more negative potential also oxygen is reduced, and in the case of more positive

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An Amperometric Method of Determining the Ozone Concentration in a Gas Flow

32-24-4-10/67

potentials a dependence on time and the condition of the surface becomes noticeable. Parallel with the amperometric determination also an iodometric determination of the same gas mixture was carried out, and 0.5 nKJ + 1.15 g/l $Na_2B_4O_7$ + 11.6 g/l H_3BO_3 was used as absorption liquid and the separated iodine was titrated in the acid medium with a 0.1n $Na_2S_2O_3$ solution. A linear dependence of the boundary current on the ozone concentration in the gas mixture was observed. There are 5 figures, and 2 references, 2 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy fiziko-khimicheskiy institut im. L.Ya. Karpova (Scientific Research Institute for Physics and Chemistry imeni L.Ya. Karpov)

1. Gas flow--Analysis 2. Ozone--Determination 3. Gas flow --Testing equipment 4. Iodine--Volumetric analysis 5. Cathodes--Performance 6. Oxygen--Reduction

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5(4)

AUTHORS: Rakov, A. A., Veselovskiy, V.I., Nosova, K.I., Kasatkin, E. V., Borisova, T. I.

SOV/76-32-12-8/32

TITLE: The Mechanism of the Joint Electrochemical Formation of Ozone, Persulfuric Acid and Oxygen on the Platinum Electrode (O mekhanizme sovmestnogo elektrokhimicheskogo obrazovaniya ozona, nadsernoy kisloty i kisloroda na platinovom elektrode)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 12, pp 2702 - 2710 (USSR)

ABSTRACT: The electrolysis is carried out in 10n sulfuric acid with a cylindrical platinum electrode refrigerated by methyl alcohol. Analyses of H_2O_2, H_2SO_5, $H_2S_2O_8$ and ozone and measurements of the general acid concentration were carried out in brief intervals. Two stages were observed (at $-50^{\circ}C$ and 0,5 A/cm^2). In the first stage oxygen was formed at a potential of 1,0 to 1,8 V, while in the second stage the potential rose to 3,0 V resulting in a high persulfuric acid yield and a low ozone yield. The transition took place within 1 to 2 minutes. By means of a rapidly revolving platinum electrode in the

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The Mechanism of the Joint Electrochemical Formation of Ozone, Persulfuric Acid and Oxygen on the Platinum Electrode SOV/76-32-12-8/32

Dewar flask which was filled with a freezing mixture of carbon-dioxide snow and methyl-alcohol, polarization curves were plotted at various temperatures in 10n sulfuric acid. Also in this case the jump in potential was noted, the curves differing according to whether they were plotted beginning at a low amperage and ending at a high one, or vice-versa. All showed a hysteresis loop. At a temperature of -70°C a third stage occurred in which ozone is produced abundantly at a potential of 5.5 to 7.0 V. These jumps in potential and the chemical reactions due to them are explained by the changing surface finish of the electrode and the influence of intermediate platinum compounds. There are 8 figures and 19 references, 7 of which are Soviet.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova Moskva (Physico-Chemical Institute imeni L. Ya. Karpov, Moscow)

SUBMITTED: July 10, 1957

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KASATKIN, F.

Wages in machinery manufacturing enterprises and their relation to production quality. Sots. trud 6 no.5:41-46 My '61. (MIRA 14:6)
(Machinery industry—Quality control)
(Wage payment systems)

KASATKIN, F. G.

Tekhnologiia rybnykh produktov /Technology of fish products./ Moskva, Pishchepromizdat, 1952, 424 p.

SO: Monthly List of Russian Accessions, Vol. 6 No. 5, August 1953

KASATKIN, F.P.

Operation of tank farms in the Maritime Territory. Neftianik 6 no.2:17-18 F '61. (MIRA 14:10)

1. Glavnyy inzh. Primorskogo territorial'no-tekhnicheskogo uchastka Glavnogo upravleniya po snabzheniyu narodnogo khozyaystva nefteproduktami RSFSR.
(Maritime Territory—Tanks)

KASATKIN, F.P.

Operation of tank farms in the Maritime Territory. Neftianik 6 no.1:15-17 Ja '61. (MIRA 14:4)

1. Glavnyy inzhener Primorskogo territorial'nogo tekhnicheskogo uchastka Glavneftesnaba RSFSR.
(Maritime Territory--Tanks)

KASATKIN, G.A.

Clinical aspects of dysentery detected in diagnostic clinics. Zhur. mikrobiol.epid.i immun. no.8:87 Ag '54. (MLRA 7:8)
(DYSENTERY)